Chapter I: Introduction

Genesis, Precursors, Definitions, Evolution, Types, and Parameters of Science Fiction
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1.1. Introduction

Science Fiction, as a new genre, existed at the beginning of the twentieth century when an American radio engineer and magazine editor, Hugo Gernsback labeled the new genre as ‘Scientifiction’ in 1926, to characterize the contents of the magazine Amazing Stories. Later, the term was rechristened as Astounding Science Fiction in 1938. It was only in the 1950’s or after the World War II that the label Science Fiction was applied to paperback novels, incorporating science.

To understand how Science Fiction evolved as a specialized form of writing or as a literary genre, it is essential to find prototypes in earlier works and to assess the basic parameters of Science Fiction. Mary Shelley’s Frankenstein (1817) was the first book in the history of writing having all the characteristics of Science Fiction. But genealogies of Science Fiction can be found in Plato’s The Republic (Fourth Century B.C.), Lucian’s Satires (Second Century A.D.), Thomas More’s Utopia (1492) and Jonathan Swift’s Gulliver Travels (1726). Similarly in India, Science Fiction writing began with Jagadananada Roy’s Shukra Bhraman (Travels to Moon) which appeared in Bengali in 1879. But some elements of Science Fiction could be seen in the Purans and the great epics, the Mahabharata and the Ramayana as well.

The present research will study the coherence between the basic parameters of Science Fiction and utilization and presence of some of the dominant parameters of Science Fiction in the selected works of Indian Writers in English. It also intends to study the projection of basic parameters of Science Fiction in the selected texts. The parameters can be grouped as:

I. The concept of science used by the selected Indian writers of Science Fiction: The researcher proposes to discover how Indian writers are successful in weaving the various concepts or theories or phenomena of
science into their works. Basically it is assumed that science is universal. So writers get the advantage of universality, naturally, by writing Science Fiction.

II. The Handling of Space and Time in Science Fiction: The researcher aims to reveal and project how Indian Science Fiction writers are good at handling space and time in their works. One assumption is that there are no limitations or boundaries for science fiction writers in regard to handling time and space.

III. The handling of characters with superpower, machineries, robots, space-voyages, space-ships combined with realism: Some writers of Science Fiction make their heroes so powerful, so omniscient and gifted as to cast doubts about whether the heroes are really gods in disguise. Science Fiction deals with the fate of the entire world or planet or Galactic Empire, or the Whole race or even the Universe. Thus Science Fiction writers create characters who not only make the Universe but also save the entire Universe. Men and women who appear in SF stories are merely representatives of humanity.

IV. The Narrative technique as benefitting in minimizing the distance between setting and events: It is really a difficult task faced by the writer in creating a narrator who can minimize the distance between setting and events, imaginary and real, improbable and probable, unbelievable and believable and impossible and possible. In the history of Science Fiction, it is seen that the narrator of Science Fiction succeeds in performing this task. He creates a sense of realism which is applicable to the present or the future or what has already happened to Mankind. The researcher proposes to explore how selected Indian writers succeed in using different techniques of narration to minimize the distance between setting and events.

V. The presence of epical pattern, element of suspense, grandeur and impossible probabilities and improbable possibilities: There is a resemblance between the form of the epic and Science Fiction as far as their elements are concerned. For instance the element of adventure, suspense, subject-matter, characterization, style appear both in the epic and Science Fiction. The present research will bring to light how selected
Indian Science Fiction writers intermingle the elements of epic and Science Fiction.

VI. Attitude of writers to Science and the Genre of Science Fiction: Many writers of Science Fiction are of the view that sociology and human relations should merge with modern sciences to facilitate writing of Science Fiction. The form has the opportunity to reach a much larger audience than other types of the novel. It is mainly because there are many scientists who write Science Fiction in the hope of providing knowledge of likely developments in science. Therefore they write very seriously about immediately likely developments. The present research is exactly about observing their attitude to both science and the genre Science Fiction.

VII. The effectiveness with which the writer juxtaposes science and its use in present and the future: Science Fiction shapes the future whatever the speculations or visions drawn by writers. They certainly affect the future. Science Fiction makes present and future predictions with a touch of logical reasoning. Selected Indian Science Fiction too talks about futuristic changes.

VIII. Interface between Science and Fiction: Basically elements of science and fiction intermingle with each other to establish an organized body of knowledge or truth. Both aim that man should be energetic, humble, constructive and critical in action and application of scientific knowledge for the betterment and improvement of material condition of life. The results are reliable and logical. Elements like vision, realism-lifelikeness, romance, suspense, truth, speculation, anticipation go together in shaping human life in the world of science and fiction. The selected Indian Science Fiction writers do the same.

IX. Prophetic Vision and changes in social, political, cultural tradition of the universe: Science Fiction writers anticipate changes in social, political, cultural tradition of the universe. The researcher proposes to present how selected writers visualize the dominant changes in the context of Indian setting.

X. Balance of realism and romance: Science Fiction mingles the genre of romance and realism. The present research will highlight how Indian writers effectively mingle the elements of romance and realism.
XI. Themes or Novum or Issues handled in Science Fiction: The common themes which Science Fiction writers handle are space voyage, rivalry of insect civilization with humanity, war tanks, man eating planets, collision with another star, super accelerating of life, man versus superman with superpower, germ development, future city, decline and fall of galactic empire and so on. Indian writers show innovation in handling the issues relating to society. The researcher has attempted to project universality of theme in the selected works of Science Fiction.

Jayant Narlikar’s *The Return of Vaman* (1990), Rimi B. Chatterjee’s *Signal Red* (2007), Anil Menon’s *The Beast with Nine Billion Feet* (2009) and Samit Basu’s *Turbulence* (2010) have been selected for the present research for the application and analyses of these parameters of Science Fiction.

The present chapter critically examines the definitions of Science Fiction, traces its development as a literary genre in its own right and evaluates the contribution made by some prominent writers to this genre including Indian Science Fiction writers. The present research attempts to examine in some details Jayant Narlikar’s *The Return of Vaman* (1990), Rimi B. Chatterjee’s *Signal Red* (2007), Anil Menon’s *The Beast with Nine Billion Feet* (2009) and Samit Basu’s *Turbulence* (2010) from the point of view of their theme and technique of presentation, handling of characters, plot, setting and science in relation to the parameters of Science Fiction. Therefore at the end of this chapter a brief survey of Indian Science Fiction and critical attitudes to these selected writers as Science Fiction writers have been discussed.

It is important to conduct a brief historical account of Science Fiction as there has been prolific writing in it. The researcher here tries to trace the development of Science Fiction as a background to study the selected Indian Science Fiction. It is generally observed in the case of literary genre, the genesis and definitions of Science Fiction are disputed in literature. The researcher has presented the views of prominent critics and writers to arrive at the major characteristics of Science Fiction and its features.
1.1.1. Science Fiction: Some Prominent Definitions and Characteristics

Defining a literary genre has always been a difficult task. Many literary scholars still struggle with the definitions of some literary forms like novel, short-story, one-act play etc. It happens because literature is a dynamic field, where literary artists experiment with the existing literary forms, innovative new ones and sometimes create novel combinations which defeat definitions. Yet it is a human tendency to systematize explanations by classifying, categorizing and defining the world around. In fact, we spontaneously know what a novel is or what a short-story is. But when we try to define it we try to set a boundary around it and some literary works hang on at the boundary or go beyond it or force us to reconstruct the boundary wall to admit some new phenomena. We face the same problem when we try to define Science Fiction. We naturally know what Science Fiction is. A bookseller maintains a separate shelf for Science Fiction where we find paperback volumes with bizarre pictures of strange machines, robots, wired people etc. on their cover pages. However, for the purpose of the study of Science Fiction it is necessary to have some kind of a working definition of it. This section examines some important definitions of Science Fiction and arrives at the most significant parameters of Science Fiction.

1.1.2. Origin of the Term ‘Science Fiction’

The name Science Fiction was first used in 1928 by Hugo Gernsback the editor of the magazine *Amazing Stories*. He first used the term ‘scientifiction’¹ to characterize the stories based on scientific imagination which used scientific gadgets and the knowledge of science dealing with strange lands populated by equally strange people. After three years he changed this name to Science Fiction. Parrinder Patrick notes that ‘the term was excessively attached to magazine fiction and to the anthologies which reprinted such fiction. It was only in the 1950’s, that the label ‘Science Fiction began to be applied to paperback novels’.² It shows that the genre Science Fiction got its name only in the first half of the 20th century. But in the field of literature, literary works resembling a literary type can be found much earlier than its date of establishment as a genre. To define the genre called Science Fiction is a difficult task. Should we include Plato’s *Republic* in Science Fiction? Should utopias be described as Science Fiction? Can we say that Mary Shelley’s *Frankenstein* (1817) is Science Fiction written in order to fulfill Gothic tradition? A definition of Science
Fiction has to answer such questions. Therefore if we wish to define and study a literary genre, it is necessary to find out the criteria, which can help to identify works belonging to that literary genre. We must also identify the practitioners and the reading public of that literary type and their purposes. Keeping this in view there is a need to study critically some important definitions of Science Fiction to understand its characteristics and purpose.

1.1.3. Science Fiction Defined in Relation to Science and Technology:

The Oxford English Dictionary defines Science Fiction as

Imaginative fiction based on postulated scientific discoveries or spectacular environmental changes; frequently set in the future or on other planets and involving space or time travel.\(^3\)

Here the word ‘imagination’ has been used to contrast Science Fiction with the real in the fictional forms like novel and short-story. These forms, normally, deal with day-to-day life and characters and are characterized as realistic forms of fiction as opposed to the fantastic. The expression ‘postulated scientific discovery’ refers to inventions such as the submarine, which was postulated in Jules Verne’s *20000 Leagues Under the Sea* (1872), where we for the first time come across Nautilus, the prototype of the modern Submarine. The aspect of ‘spectacular environment changes’ can be seen in Science Fiction like Frank Herbert’s *Dune* (1965). Science Fiction deals with strange laws and people who are situated either in future or on some other planet. Space travel has also long been a postulated scientific discovery. The idea of travel through Time Machine has been made popular by H.G wells. The OED definition does not mention robots, computers, strange people like aliens etc. However it underlines the fact that Science Fiction is based on the ‘difference’\(^4\) - the otherness of the land and the environment. It is concerned with the world unfamiliar to the reader, the world not of his immediate experience. The New Encyclopedia Britannica defines Science Fiction as follows:

Science Fiction, a literary genre, developed primarily in the 20\(^{th}\) century, dealing with scientific discovery or development that, whether set in the future, in the fictitious present, or in putative past, is superior to or simply other than that known to exist.\(^5\)
This definition emphasizes the content of Science Fiction which is a scientific discovery or development and its unrealistic time frame. It also situates the emergence of the genre in the 20th century. The OED definition does not specifically say when the Science Fiction began as a form. Britannica’s definition, however, does not mention space travel or other planets. It refers to superiority of the Science Fiction, and scientific discoveries. Space travel, for example, is a later possibility. The present day science is still struggling with it, but in the Science Fiction it is a vogue. This definition does not note the ‘otherness’ of the land and the people in the Science Fiction.

1.1.4. Darko Suvin’s Definition

The aforesaid definitions do not tell us specifically how we can differentiate Science Fiction from other imaginative works of fiction. For example, fairytale stories are imaginative fiction dealing with either fictitious present or supposed past. Tolkien’s Lord of the Rings deals with an imaginative land and the people in the putative past that can be called imaginative fiction. In Kafka’s novel, Metamorphose (1915), the hero is transformed into a giant insect. Can this be called Science Fiction? Similarly in The Strange Case of Dr. Jekyll and Mr. Hyde (1886) by Stevenson, Dr. Jekyll transforms himself into a chemical.

Darko Suvin (1979) has provided a criterion to distinguish Science Fiction from the scientific romance like Frankenstein and Dr. Je and Mr. H. He has coined the term ‘novum’ (a new thing) to bring out the point of difference between Science Fiction and Scientific Romances. According to Suvin, Science Fiction is based on ‘novum’ such as the device like the Time Machine in H. G Wells’ novel The Time Machine in which the hero is enabled to travel through Time. In Mary Shelley’s Frankenstein a corpse is reanimated to become a monster. But how this monster is manufactured in the laboratory is only a matter of speculation. There are no details about how this was achieved. It is true that Frankenstein exerted great influence on the later Science Fiction. Essentially it is a Gothic Romance, in the tradition of the 19th century gothic novel, which can be the forerunner of the Science Fiction, but not Science Fiction proper. Similarly Kafka in Metamorphose (1915) does not explain how his protagonist was transformed into a giant insect. Besides, in this novel, Kafka is mainly interested in the alienation of his hero who suffers and not in the agents of
physical transformation he undergoes. On the other hand, Ian Watson in his novel *The Jonah Kit* (1975) uses a new technology which maps the brainwave patterns of a human on to the mind of wheat. Here, as Suvin would say, there is a postulated scientific agent of action that brings about a change, the alterative factor, a Novum, in his terminology. Thus Watson’s novel can be classified as Science Fiction but not Kafka’s. There is an emphasis on postulated scientific discovery or development, some mechanisms, which take into account the present principles of Science, which Science Fiction should use in the story. H.G.Wells in his *The First Men on the Moon* (1901) shows a scientist who invents a metal, which resists gravitation. He constructs a vehicle of this metal, in which he and his friends float off to the moon. Jules Verne objects to this as a Science Fiction. He points out that in his own novel *From Earth to the Moon* (1865) his protagonist achieves escape velocity from gravitation having been fired from an enormous cannon ball. He claims to have used present day physics to postulate such a cannon ball. But Wells’s ‘Metal’, according to Suvin was sheer impossibility.

Suvin’s idea of ‘Novum’ tells us that Science Fiction can be distinguished from other forms of imaginative fiction. There can be more such novum- the novas- which can explain particularities of Science Fiction.

There are definitions of Science Fiction by well-know critics like Darko Suvin, Robert Scholes and Darrién Broderick, which have exerted great influence on the study of Science Fiction. Darko Suvin defines Science Fiction as:

A literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imagination frame world alternative to the author’s empirical environment.\(^6\)

The terms ‘estrangement’, ‘cognition’, and ‘alternative’ are the key terms in the definition. Estrangement refers to the element of difference in Science Fiction, which alienates us from our day-to-day world. Cognition refers to rational logical understanding of the landscapes and people of a strange world, totally unfamiliar to readers. According to Suvin both these are necessary in Science Fiction to make it relevant to our world. Secondly, Science Fiction presents to us the ‘alternative’ world which should be within the range of possibility. It should obey the principles of
science. Jules Verne, as pointed out above, rules out the metal that resists gravitation in Wells’s novel *The First Men on the Moon*.

Suvin makes it very clear that in Science Fiction scientific possibility is one of the key aspects. He requires Science Fiction to present scientific method, ‘the logical working throughout a particular premise’. A new device or a new landscape that Science Fiction presents must have cognitive logic. For example a number of Science Fiction writers wrote about canals or lakes. These Science Fiction works are acceptable because the main point about them is rational discourse. They present the alien worlds in terms which impress us as scientific discourse.

### 1.1.5. Robert Scholes: Discontinuity from the Known World

Robert Scholes looks at Science Fiction as ‘Structural Fabulation’. He defines Fabulation as “any fiction that offers us a world clearly and radically discontinuous from the one we know, yet returns to confront that known world in some cognitive way”. 7

Here, Scholes emphasizes that the world of Science Fiction is different from our actual world but at the same time Science Fiction comes back to this world of ours in some cognitive way. In other words, he means that Science Fiction is not an escape from this world. It is on the other hand part of the system to which this world belongs. Science Fiction is aware of the universe as a system of systems, a structure of structures: This Structural Fabulation may not follow scientific methods and it is also not a substitute for actual science. According to him Science Fiction or Structural Fabulation explores human situations, which have brought to light the invention of recent science. Scholes has thus given Science Fiction a deeper meaning and has placed it in the mainstream of 20th century literature.

### 1.1.6. Post-Modern View of Science Fiction

The latest effort of defining Science Fiction is by Damien Broderick, who himself is a writer of Science Fiction as well as a critic looking at this genre from a theoretical point of view. His definition of Science Fiction runs as follows:
Science Fiction is that species of Story-telling narrative to a culture undergoing the epistemic changes implicated in the rise of supersession of technical- industrial modes of production, distribution, consumption, and disposal. It is marked by (i) metaphoric strategies and metaphoric tactics,(ii) the foregrounding of icons and interpretative schemata from a collectively constituted generic ‘mega-text’ and the concomitant de-emphasis of ‘fine writing’ and characterization and (iii) certain priorities more often found in scientific and post modern texts than in literary models: specifically attention to the object in preference to the subject.  

Broderick places Science Fiction within the story-telling genres of the novel and the short-story, and traces its emergence to the changes brought about by technoidustrial revolution of the 20th century. He explains the writing techniques of Science Fiction broadly as metaphoric and metonymic. Metaphoric in the sense that the world of Science Fiction metaphorically presents the real world and metonymic in the sense that elements in Science Fiction partly stand for the real world. For example, the time-machine, as a novum, is the part of the imagined world of Science Fiction. The whole novel is a metaphor for the real world. Another important aspect of Broderick’s definition is his mention of ‘de-emphasis on fine-writing’ in Science Fiction. He recognizes Science Fiction as a popular mode of writing. The authors of Science Fiction pay more attention to the presentation of the object rather than the literary style of writing. A Science Fiction writer cannot spend his time and space in presenting well developed round-characters, because in Science Fiction the characters are part of the equipment of Science Fiction, not the real people. Most Science Fictions have very thin plot, artistic style and shallow characterization. Broderick, here, tries to accommodate popular pulp Science Fiction. He appears to suggest that Science Fiction is not ‘serious’ or high art. Some practitioners may not agree with him.

1.1.7. Wells and Heinlein: the Methodology of Presentation

Earlier, H.G.Wells, who greatly contributed to the evolution of Scientific Romance into modern Science Fiction, believed that:
the living interest in the Science Fiction lies in their non-fantastic elements and not in the invention itself. The thing that makes such imaginations interesting is their translation into commonplace term and a rigid exclusion of the other marvels from the story. Then it becomes human….As soon as the magic trick has been done the whole business of the fantasy writer is to keep everything else human and real.9

Wells, here, is trying to restrict the element of invention (pseudo-scientific device or mechanism) in Science Fiction and then explores its consequence in a rigorous realistic manner. Robert a Heinlein, a writer and a critic, also believes in presenting an essentially realistic picture of social development through Science Fiction. He calls Science Fiction ‘Realistic Future-Scene Fiction’ and defines it as:

A realistic speculation about future events based solidly on adequate knowledge of the real world, past and present, and an understanding of the nature and significance of the scientific method.10

Both, Wells and Heinlein underline ‘human problems’ and ‘a realistic picture of social development’ in their definition of Science Fiction. After 1960, in the new wave Science Fiction, the new generation of writers took liberty with the speculation elements in Science Fiction. The Post-modern writers Thomas Pyncheon, John Barth and others considered all experiences to be science fictional. This post-modern attitude influenced the New Wave Science Fiction writers.

1.1.8. Alien Encounter or the Other World

The aforesaid definitions of Science Fiction emphasize the encounter with a world that is different. It is the ‘otherness’ of the aliens, of the landscape; of the flora and fauna, which, Science Fiction explores with the help of a “novum”. McCracken says that “at the root of all Science Fiction lies the fantasy of alien encounter…the meeting of self with the other is perhaps the most fearful, most exciting and most erotic encounter of all”.11 This explains the tremendous interest of Science Fiction readers in Science Fiction dealing with aliens from Mars and other planets. The planets, the terrestrial land, also function as the alterity-the otherness of the earth. What is more, Science Fiction provides a form to deal with the otherness, or alterity of gender, race, and even alternative ideology. Science Fiction can give symbolic
expression to female experience or the experience of being black in the white majority, or in the Indian situation belonging to the low-caste.

1.1.9. Novas: the Subjects and Themes

Now with reference to these definitions, it is possible to categorize the subjects and themes, which differentiate Science Fiction from fantasy and other kinds of literary fiction. Adam Roberts makes it very clear that it is the element of theme that differentiates Science Fiction from other literary genre due to metaphoric and symbolic presentation. The themes comprise spaceships, interplanetary or interstellar travel, aliens and the encounters with aliens, mechanical robots, genetic engineering, biological robots, androids, computers, advanced technology, virtual reality, time travel, alternative history and fantastic utopias or dystopias.

The success of the Science Fiction lies in balancing the elements of ‘estrangement’, (alienation or otherness) and ‘cognition’ (scientific rationale behind the Science Fiction, the ‘novum’ introduced by it). Samuel Delaney looks at Science Fiction as a ‘symbolist genre because it seeks to represent the world instead of reproducing it’. Darko Suvin also calls Science Fiction “a symbolic system…centered on a novum which is to be cognitively validated within the narrative reality of the tale”. The symbolism in Science Fiction is however different from the one used in mainstream literature. It is akin to realistic mode of fiction in giving details of the new world. It is so because ‘novum’, in Science Fiction must be explained convincingly in concrete terms.

With the help of these definitions of Science Fiction, themes and subjects it deals with and its methodology, the researcher undertakes to study the history of Science Fiction, briefly, to understand its genesis and progress throughout the 19th and 20th centuries.

1.2. Science Fiction: A Brief Historical Review

As it is very necessary to find the evidences of parametric structure of the form, the researcher believes in conducting a detailed historical review of the genre.
1.2.1. The Question of the Origination

In tracing the history of a popular literary genre, the first question that we face is about its origin. This question is tied up with the definition of the genre, or its characteristic features. Some scholars, who try to study the history of the novel, begin with Plato’s *Republic*. Aristotle’s observation about gravitational force cannot be denied. The case of Science Fiction is not different. If we take the element of ‘estrangement’ or ‘alterity’ as a focal point, a Utopian Fiction can be classed as Science Fiction. The travels of Gulliver to Laputa, or to the land of horses can also be called Science Fiction. This problem arises because Science Fiction is also a part of literature in general and as a result of it shares some generic features of literature with other forms. It has affiliation with other sub-classes of literature.

All definitions of Science Fiction emphasize the element of science in it. There are, of course, differences of opinion about what counts as science and how the elements of science figure in Science Fiction. If we examine the critical research articles on Science Fiction, we find that Science Fiction, as a recognized literary genre, is the phenomenon of the 20th century. Peter Nicholls, a critic of Science Fiction, says that “Science Fiction proper requires a conscious outlook which did not emerge until the 19th century”. 14 In the *Epic of Gilgamesh* and in the *The Bible*, there are fantastic scenes and miraculous occurrences. In Indian mythological history ‘*The Ramayana*’ there is a mention of stones floating on the water and the miraculous ‘Pushpak’ a plane in which Rama travels from Lanka to Ayodhya. But the criteria given by Nicholls rules out such works from Science Fiction. Though scientific outlook emerged in the 17th century western society, the background for Science Fiction came into existence in the second half of the 19th century, during the industrial and technological development. Space travel or travels to the planet has been the dream of man, but it received the scientific and technological outlook only in the industrial age i.e. the 19th century. Though the texts such as Mary Shelley’s *Frankenstein* and the fiction of H.G.Wells and Jules Verne appeared in the 19th century there was no awareness of Science Fiction as a literary genre. However, we must note that literary forms evolve from earlier practices.

A form does not emerge all of a sudden in a particular year, nor does a publication of a particular book launch a form of literature. Characteristics and conventions which have been noted in 1.08 appear isolated in one or the other literary work. For example, voyage to the moon had become a convention in literature from
the 17th century onwards. Similarly future wars, aliens from other planets, strange people, and strange landscape, have also been conventions in Romances and Pseudo-travelogues. They cannot be called Science Fiction, but they do provide a background to Science Fiction.

1.2.2. Proto-Science Fiction: Scientific Romances

As noted earlier, in the definition of Science Fiction, by Suvin and others, Science Fiction proper is distinguished from the Scientific Romances even from the time of Galileo onwards. These may include a Syrian novelist Lucian’s *True History* written in the second century A.D., in which the narrator sailing in the ship is caught by a hum cane and hurled into the sky from where it sails on to the moon. Fabulous tales of imaginary voyage or Utopian Fiction in which ideal societies were imagined are not Science Fiction in the sense the 20th Century Science Fiction criticism defines it. But these works include conventions and characteristics which were later assimilated into Science Fiction. Thomas More’s *Utopia* (1516), Jonathan Swift’s *Gulliver Travels* (1726), Kepler’s *Somnium* (1634), Cyrano de Bergerac’s fantastical *Voyages to the Moon and Sun* (1656) make use of imagined societies to criticize the world of reality with which they were utterly dissatisfied. The element of the ‘other’ in them appears to relate them to Science Fiction, but they cannot be listed as such.

Science Fiction requires material and physical rationalization rather than merely fabulous or supernatural set of events. These Utopias do not have scientific outlook. Even the element of ‘other’ in them is disputed, because the imagined society in them actually reinforces the existing society by criticizing only the evils in them.

Thus it has been noticed in the definitions of Science Fiction that Science Fiction is a form of literature dealing with the encounter with a ‘difference’. This element of difference is materially and rationally characterized in it, so that it can help us in our classification of ‘Ur-Text’ of Science Fiction. It is also called Scientific Romance, the term first used by Charles Howard Hinton as the title of an anthology published in 1886. This Proto-Science Fiction or Scientific Romance was a phenomenon of the Romantic period’s Gothic Fiction of Horace Walpole and others. Brian Aldiss, the author and critic of Science Fiction, maintains that “Science Fiction was born from Gothic mode of Fiction. The gothic emphasis was on the distant and it’s unearthly”.

Mary Shelley’s *Frankenstein* is written in Gothic tradition as well as bears the influence of Milton’s *Paradise Lost*, especially the figure of Satan. Frankenstein, the
monster, was created in the laboratory; however, the chemical process involved in his creation is not explained. It has been discussed earlier as to why the text is more Romance, Gothic than a Science Fiction. But *Frankenstein* exerts a great influence on Science Fiction. Darko Suvin has noted that this novel set in motion a recurrent theme of Science Fiction, the idea that “progress becomes indissoluble from catastrophe”.

Another very interesting development in the Gothic and Post-Gothic Fiction was the interest in the abnormal states of psychology. Edgar Allan Poe’s *The Narrative of a Gordon Pym* is an instance. Oliver Wendell Holmes’ *Elisie Verner* shows interest in multiple personalities, while Edward Bellamy’s *Dr Heidenhoff’s Process* (1880) deals with the psychological experiment of erasure of the memory of evil. Stevenson’s *Strange Case of Dr Jekyll and Mr. Hyde* (1888) is concerned with the same problem. The doctor wishes to purify his moral nature by taking out the evil in him, but the monster in him finally dominates him.

These works have been important for their influences on Science Fiction of the 20th century. But this mode of writing really developed with Jules Verne and H.G.Wells. Gernsback- the editor- writer- critic-and historian of Science Fiction always mentioned that the precursors of Science Fiction were Edgar Allan Poe, Jules Verne and H.G. Wells. Jules Verne was a French writer, who wrote stories of fantastic voyages such as *Journey to the Center of the Earth* (1863), in which the scientist and his party travel down the shaft of an extinct volcano into hollow space at the center of the earth. The description of caverns and caves and monstrous animals are akin to that of the Gothic romances. However, his *20000 Leagues under the Sea* (1972) presents a high-tech Submarine, Nautilus, which becomes the forerunner of the modern submarine. Jules Verne prided himself on his inventive scientific apparatuses. In his other voyage story, *From the Earth to the Moon* (1865), the spaceship can escape the pull of gravitation when being fired by a gigantic cannon ball. In Darko Suvin’s terminology, his Nautilus and the Spaceship fired by a cannon ball become truly the Science Fiction novum. Verne was very careful about relating his inventions to the existing technology.

Both Jules Verne and H.G.Wells have been described as the great pioneers of Science Fiction. Patrick Parrinder calls Wells “the pivotal figure, in the evolution of Scientific Romance into modern Science Fiction”. Wells explored a number of themes in Science Fiction, namely, time-travel, the alien invasion, biological
mutation, the future city, and the anti-utopia. Like Verne’s submarine, Wells was also prophetic about the tank in Warfare, the atomic bomb and the warplanes. But he was also interested in the purely hypothetical scientific fantasy as in his *Time Machine* and the short novel *The Island of Doctor Moreau* (1896). He requires his readers to accept his speculative hypothesis – the Time Travel-and then he explores its consequences in a rigorous realistic mode of writing. This can be noticed in his *The Invisible Man* (1897), *The War of the Worlds* (1898) and other Scientific Romances.

Both Wells and Verne wrote Scientific Romances. But the ‘romance’ element in their writing was restricted to the speculative premise with which they started. They are therefore credited with rescuing Science Fiction from the kind of Romance writing in Romance Fiction of Alexander Dumas, Victor Hugo, Rider Haggard and others. As pointed out earlier the human society they projected was the same as that of the contemporary world. The rise of Romance Fiction in the 20th century was in fact a reaction to the Realism and Naturalism in Fiction. But Wells advises the writers “to keep everything else human and real” and further adds that “touches of prosaic details are imperative and a rigorous adherence to the hypothesis”.

1.2.3. Magazine Era: Gernsback’s Key Role in the Development of Science Fiction

The period from 1870 to 1926 is regarded as that of the emergence and development of Scientific Romance. In the history of Science Fiction magazine contribution, the year 1926 is very prolific. It is because Hugo Gernsback founded the first Science Fiction magazine *Amazing Stories*. Gernsback was the first to start a campaign for Science Fiction in a literary history. In the magazine’s editorial page written by him in 1929 issue of *Amazing Stories*, he says:

Nor only is Science Fiction an idea of tremendous impact, but it is to be an important factor in making the world a better place to live in through educating the public to the possibilities of science of life. If every man, woman, boy and girl could be induced to read. Science Fiction right along, these would certainly be great resulting benefit to the community. Science Fiction would make people happier, give them a broader understanding of the world, and make them more tolerant.
We can see that Gernsback’s intentions were serious, didactic and educational. His contemporary John W. Campbell who edited *Astounding Science Fiction* (1939) expanded the role of Science Fiction in shaping the life and ideas of the people. Gary Westfold in his *The True History of Science Fiction* (1997) gives credit to Gernsback for establishing Science Fiction as a literary genre.

In spite of Gernsback and Campbell’s efforts, the Science Fiction magazines produced fast-paced exciting stories which were poor in conception and morally deprived. But these magazine series made Science Fiction popular. Gernsback contributed towards providing science education through scientifiction as he explained scientific concepts and scientific values of the work. There was a regular debate through letters written by readers to the editors of magazines. The readers commented and analyzed the Science Fiction stories. As a result of this the genre of Science Fiction grew in stature, in literary tradition, particularly in America. Sam Lundwall in his *Science Fiction: An Illustrated History* accuses that Science Fiction was “stolen by the Americans from the Europeans”. This was because in Europe and England, Science Fiction writing had started earlier, and the writers such as Verne, Wells, and Shelley produced valuable works. But after 1920s this genre appears to have lost its place, while in America it grew stronger.

Edgar Rice Burroughs wrote his sequence of eleven Mars novels – the Barsoom Sequence during 1920s. The first of this sequence, *A Princess of Moors* appeared in 1912. The hero in these novels uses ‘novam’ like radium pistols and antigravity fliers. E.E.DocSmith (1890-1965) was another Pulp Science Fiction writer. His *Lensman* novels are colorfully imaginative and do not obey the rules of Gernsback prescribed for Science Fiction. Smith has created a picture of the universe divided between the Good and Evil aliens such as Arisians and Eddonans. Arisians are like human beings, but the Eddonans have revolting shapes. We are reminded of tentacle Martians in the fiction of Wells. There are enormous space ships in his fiction and the heroes use gadgets like ‘lens’ which is a bracelet giving them power of telepathy.

1.2.4. The Golden Age of Science Fiction: Asimov and After

Before the World War II the Pulp Science Fiction was produced mainly in America for the entertainment of the young readers. But Edwards James in his
Science Fiction in the Twentieth Century (1994) states that during 1940s and 1950s American Science Fiction developed in maturity and complexity and in quality. It can be unanimously described that 1940s and 1950s as the Golden age of Science Fiction. It is because in this period works of talented writers like, Issac Asimov, Clifford Simak, Jack Williamson, L. Sprangue de Camp, Theodore Sturgeon, Robert Heinlein, A.E. Van Vogt produced their works. They tried their hand at many vast themes and subjects for example George Orwell’s 1984, Ray Bradbury’s Fahrenheit 451 and Heinlein’s Double Star, human destiny: e.g. Asimov’s Foundation Trilogy and Blish’s Cities in Flight, description of aliens: e.g. Clements’s Mission of Gravity and Wyndham’s The Midwich Cuckoos, new technology: e.g. Heinlein’s Starship Troopers and new physical and mental capacities:e.g. Smith’s Hens men, Van Vogt’s Slan and Anderson’s Brain Wave.

Heinlein’s Sixth Column (1941) deals with the fear of the World War III. Lester de Rey’s Nerves (1942) describes terrible danger of atomic experiments. Paul Anderson’s Tomarrouls Children (1947) deals with the fear of genetic alternation in the population after the explosion of atomic bomb. The cold war between US and USSR was also reflected in some Science Fiction. The prominent figure of this period was Asimov, who is supposed to have revolutionized the form of Science Fiction. His ‘Foundation Books’ presents the story of a scientist, Hari Sheldon, who established his foundation to rebuild civilization after the downfall of a galactic Empire.

1.2.5. The New Wave Science Fiction

Adam Roberts, in his Science Fiction, observes that after 1950’s Science Fiction in America was characterized by increasing unease. The Science Fiction of Asimov’s age enjoyed confidence that ‘science applied properly could solve all problems, but find in the 1950s, an increasing skepticism’. He traces this unease and skepticism to the atmosphere of suspicion and the fear of communism created by the campaign of Senator McCarthy. There was a public witch-hunting of sympathizers of communism. It is reflected in Science Fiction. For example in Jack Finney’s Body Snatchers (1955) the writer depicts a small American town is invaded by Alien Spores from Space. Aliens look exactly like a human being. The New Wave Science Fiction writers used art of mainstream novels with emphasis on character analysis, the use of stream of consciousness technique in the narration, the use of the technique of
Radio, film and television in the structure and the use of knowledge of other sciences and so on. This New Wave Science Fiction became greatly popular. Paperback editions of the stories and novels took the place of magazines. The prominent New Wave writers were Paul Anderson, Philip Jose Farmer, Frank Herbert, Ursula Le Guin, and Roger Zelazny, who competed for popularity with mainstream writers.

During the 1960’s and the 1970’s Science Fiction writers such as Aldiss, Delany, Ballard, Ellison, Moordock, Reed, and Russ explored themes such as politics, sex, radical politics and religion which were once taboo in Science Fiction.

1.2.6. 1970’s and Arthur C. Clarke

Science Fiction is no more merely Pulp Fiction now. It has become a literary phenomenon of serious study not only in America but in Europe and other parts of the world. It has become a part of mainstream literature. The success of the Star Trek (1966-68) series on Television and the films such as Star Wars (1977), more recent Independence Day, The Terminator, ET, Jurassic Park, and Avatar have been phenomenal. Another significant aspect of the New Wave Science Fiction has been the increasing interest shown by women writers in Science Fiction. So far in the 19th and early 20th century, Science Fiction was written by male writers (barring one or two exceptions) and the readership of Science Fiction was predominantly male readers, so that the capsule of the archetype installed by her makes men respect women. A number of such ‘novas’ used in the Feminist Science Fiction point to the aim of the feminist writers to interrogate reality, subvert the patriarchal society and present the image of future women.

Arthur Charles Clarke made significant contribution to the development of new Science Fiction. His popular novels were Childhood's End (1953), Earthlight (1955), Rendezvous with Rama (1973), and The Fountains of Paradise (1979). He collaborated with Stanley Kubrick in making 2001: A Space Odyssey (1968, film and novel). In 1997 he published 3001: The Final Odyssey. In 1945, Clarke proposed the concept of positioning an artificial satellite in an orbit. Today dozens of such communication satellites orbit the earth which is remarkable innovation of science and technology.

After 1970s the form of Science Fiction evolved as a New Form as it handled a variety of new themes, new concerns and new subjects. The form became more popular with the screening media. The very first theme it handled was the issue related to ‘race’. Aliens, robots and superheroes are presented metaphorically as figures of ‘Otherness’. For example, Marvel Comics, a magazine, introduced a number of African-American superheroes as appear in Black Panther (1966), Luke Cage (1972), Black Goliath (1975), and Black Lightning (1977). Some writers even used the genre Science Fiction as a framework to reflect the consequences of colonialism and systematic racism. Christopher Priest’s Fugue for a Darkening Island (1972) and John Hersey’s White Lotus (1975) handle white Americans subjected to experience of slavery.

Secondly, gender issues or feminine concerns were projected by a group of feminist Science Fiction writers. They switch the issues, namely, right to education, employment and property ownership, legal equalities, reproductive rights, domestic and sexual violence. Joanna Russ in her essay ‘The Image of Women in Science Fiction’ (1970) raised the question of extension of cultural roles assigned to women. Her novel The Female Man (1975) tries to give an alternative or marginalization. After Russ, Syzette Elgin, Jody Scott, Ursula Guin, Connie Willis, Pamela Sargent, Carol Emshwiller, Marge Piercy contributed to the development of Feminist Science Fiction.

The third issue raised in Science Fiction was environment and ecology system. Science Fiction touched the subjects like overpopulation, chemical reactions, pollution, limitation in producing food, resource depletion, and global warming. Thomas Disch edited Ruins of Earth (1973) which handles the issues like disappearance of Earth, human extinction and ubiquitous automation. Harry Harrison’s Make Room, Make Room! (1976) and Mary Rosenblum’s Dry Lands (1994) portray over crowdedness and limited availability of resources to control the crowd. Like Science Fiction, Science Fiction movies depicted the topics related to environment, successfully.

Thus, being a new kind of literature Science Fiction touches a variety of ‘new’ issues, subjects, concerns, and themes during the period 1970s to 2000. Along with this, writers experimented with the form as well. As a result of this, new sub-types or sub-genre of Science Fiction appeared, namely, Cyberpunk Science Fiction, Steampunk Science Fiction, Apocalyptic Fiction, New Space Opera Fiction, and Ecological Science Fiction.

**1.2.8. Types of Science Fiction**

Under this heading the researcher undertakes an overview of various types of Science Fiction that emerged under the broad category of Science Fiction. The researcher intends to discuss only the prominent types of Science Fiction. First is Anthropological Science Fiction. It deals with the knowledge of social, biological sciences and the humanities and physical sciences. Such type of science fiction tries to answer to the question: What is man? The major contributors were Ursula K. Le Guin, Joanna Russ, Ian Watson, and Chad Oliver.

Second type of science fiction is apocalyptic and post-apocalyptic fiction. The first is anxious about the end of human race. It portrays possible catastrophes such as nuclear war, attack of other planet, revolt of cybernetic, supernatural phenomena, climate change, end of resource, collapse of ecology, or other general disasters. Whereas Post-apocalyptic fiction deals with what happens in a world after such a disaster. The time-frame is immediately after the disaster. Post-apocalyptic stories often set in a non-technological future world, or a world where only scattered elements of technology remain. Such types of science fiction received popularity only after the World War second.

Gothic Science Fiction is another subgenre of science fiction. As the name suggests, it involves gothic elements. It stands on the belief that vampires are aliens as depicted in Richard Matheson's novel *I Am Legend* and in George R. R. Martin's
Fevre Dream. In his book Billion Year Spree, Brian Aldiss argues that science fiction is an outgrowth of gothic fiction referring to Mary Shelley's Frankenstein.

Hard Science Fiction emphasizes scientific accuracy or technical details or both. In 1957 the term was first used by P Miller in a review of John W. Campbell, Jr.’s Islands of Space in Astounding Science Fiction. In opposition to hard science fiction, Soft science fiction category emerged. It deals with social sciences namely, sociology, psychology, political science. Soft science fiction concerns with character and speculative societies, rather than scientific or engineering speculations. H. G. Wells could be considered the pioneer of such science fiction. Comic science fiction is a subgenre of soft science fiction. It exploits the conventions for comic effect. It mocks or satirizes Science Fiction conventions like alien invasion of Earth, interstellar travel, or futuristic technology. Henry Kuttner and Arthur K. Barne’s Pete Manx is an example of comic science fiction.

Scientific Imaginary Voyage is a type of Science Fiction story in which scientific content is moulded into a fictional structure of travel account. The first to stimulate this form was Thomas More in his Utopia (1515). After a century Francis Bacon’s New Atlantis (1627) appeared in the same manner. This form promoted new astronomic ideas. After Lucian examples of famous space voyages were Juan Maldonado's Somnium (1541), Johann Kepler's Somnium (1634), Francis Godwin's The Man in the Moone (1638), and John Wilkins' The Discovery of a World in the Moone (1638).

The Mundane science fiction movement was founded in 2002 by the novelist Geoff Ryman and among others. It is based on Todd’s idea. It focuses on stories set on or near the Earth with a believable use of technology and science as it exists at the time the story is written. The writers are busy in a serious speculation about a possible future. They imagine a future on Earth and believe that it is highly unlikely that aliens survive elsewhere on the solar.

Cyberpunk features advanced technology and radical change in the social order due to cybernetics. William Gibson started this form with his Sprawl trilogy. Its plot centers on a conflict among artificial intelligences and sets in a future Earth. The technology is demonstrated in a way that is never anticipated by its creators. Biopunk
is a variation of cyberpunk that points the near-future unexpected impacts of the biotechnology revolution. It has its roots in William Gibson's *Neuromancer*.

Military science fiction deals mainly with weapons, for military purposes and principal characters, the members of a military organization, are involved in military activity, happening sometimes in outer space or on a different planet or existing planet.

Space Opera centres on depicting high adventure amongst the stars. It is the equivalent of epic fantasy. It is characterized by beautiful women and bug-eyed monsters. Star Trek or Star Wars is actually considered the most suitable example of contemporary space opera.

As far as types of Science Fiction are concerned Isaac Asimov in his article “Social Science Fiction” published in *Modern Science Fiction* opines that every science fiction plot ultimately falls into one of the three categories: Gadget, Adventure, or Social:

*Gadget:* The focus of the story is the invention itself: How it comes to be invented, how it works, and / or what it is used for. The invention is the end result of the plot. *Adventure:* The invention is used as a dramatic prop. It may be the solution to a problem, or it may be causing the problem itself, but the main focus is on the caper and how the invention's presence helps or hinders it. *Social:* The focus of the story is on how the presence of the invention affects people's daily lives, whether for good or for ill. The chief distinction between this and the other two types is that the presence of the invention influences the plot rather than causing it or it being the goal.

Prior to the rise of John W. Campbell's *Astounding Stories* many works of science fiction fell in the category of first or second. Most of the characters in these stories were flat and stereotyped. It was mainly because Campbell concentrated on good stories, not merely good science. He desired people to examine the impacts of technology on future society. Campbell’s philosophy influenced authors such as Asimov and Robert A. Heinlein. It could be seen that many modern science fiction stories do have have elements of all three present in some degree or the other.
1.3. Indian Science Fiction: Science Fiction in Indian Vernacular Languages and Indian Writing in English

Issac Asimov puts his opinion very aptly in regard to the existence of Science Fiction form in a particular society as:

A true science fiction could not really exist until people understood the rationalism of science and began to use it with respect in their stories.

The nomenclature, Science Fiction, is assigned to those narratives or fictional works in which a writer uses scientific information or a phenomenon or a concept as a base of the story and links it with plot, characters, action and theme of the story. It is a misnomer to call Indian biographies of scientists or explanation of scientific concept or phenomenon, Science Fiction. There is a very close connection between literary elements and the basic parameters of Science Fiction. Though this form of writing appears to be very new to the readers, critics, researchers, teachers, it has been from the time of Galileo that instances or prototypes of Science Fiction have appeared. It was very early in the seventeenth and eighteenth centuries that scientific ways of understanding the world developed. Fiction became more realistic during that time. But one must note that in 1818 the first work of fiction which had all the characteristics of Science Fiction was *Frankenstein* written by a female writer Mary Shelley.

In India, Science Fiction writing is mostly episodic as seen in some of the major vernacular languages and Indian Writing in English. The very first example of Indian Science Fiction was Jagadananda Roy’s *Shukra Bhraman or Travels to Moon* which appeared in Bengali in 1879. Some dominant elements of Science Fiction could easily be seen in the Purans and the great Indian epics the *Mahabharata* and the *Ramayana*.

Marathi is one of the oldest vernacular languages of India. It has a great tradition and history of literary writing. The first popular scientific book in Marathi was printed in 1930. The first Marathi Science Fiction appeared as a work of translation published in the magazine ‘*Keral Kokil*’. It was a translation of Jules
Verne’s novel *Men on the Moon*. The Marathi title of this translated work is *Chandralokachi Safar*. After this, a few Science Fiction stories appeared before World War II. For example Waman Joshi published *Aprakash Kirananacha Divyaprakash* in 1912, S.B. Ranade wrote *Tareche Hasya* in 1916 and *Radium* in 1916, T.R. Dewgirikar’s *2018* in 1923, N.V. Kogekar published *Mrutyukiran* in 1936. All these works appeared in different Marathi magazines and journals.

The credit of popularizing Marathi Science Fiction goes to B.R. Bhagvat as he translated some Science Fictional works of H.G.Wells and Jules Verne. He published a collection of translated Science Fiction stories in *Udati Tabakodi* in 1965. Like B.R. Bhagvat, D.B. Mokashi, D.C.Soman and D.P.Khambete translated a number of works of western Science Fiction writers into Marathi at that time. The originality of Marathi Science Fiction is reflected in the works of Narayan Dharap. He wrote twenty Science Fiction novels and four short story collections of Science Fiction. Dr Niranjan Ghate, too, contributed during this time. But it was Dr. Jayant Narlikar who gave a high status to Marathi Science Fiction writing and a special identity to Marathi literature. One common thing about Narayan Dharap, Dr Niranjan Ghate and Dr. Jayant Narlikar like most Science Fiction writers is that they have a good scientific background to their credit. Later Dr.G.P. Phondke, Subodh Javdekar, and Dr. Arun Mande contributed a lot to popularize the genre of Science Fiction in Marathi literature.

There are two ways through which Science Fiction writing in Marathi and most of the other vernacular languages in India have been undertaken. One is to use Science Fiction as a tool to propagate science and the other is to use science as a tool to propagate Science Fiction as a form of literary writing. Bhalba Kelkar’s book *Vidnyanala Pankha Kalpanache I & II* is an ideal book which comes in the second category where science has been used to popularize the form of fiction. Arun Sadhu, D.B.Mokashi and Subodh Javdekar have been taking a great deal of interest in Science Fiction writing. Marathi Vidyana Parishad encourages writers and researchers of Science Fiction by organizing conferences on Indian Science Fiction in collaboration with Indian Association of Science Fiction Studies (IASFS).

Another vernacular language, Bengali, has witnessed some significant productions of Science Fiction. The first Bengali and probably, as it is mentioned earlier, the first Indian Science Fiction *Shukra Bhraman (Travels to Venus)* was
written by Jagadananada Roy in 1879. Another pioneer writer of Science Fiction was J. C. Bose. He wrote *Palatak Toofan (Absconded Tempest)* in 1896. The most notable turn occurred through the writing of the legendary Satayjit Ray. He wrote numerous Bengali Science Fiction stories for his father’s magazine *Sandesh* in 1960s and 1970s. Later his stories were translated into English. The most noteworthy work was *The Incredible Adventures of Professor Shonku*. It is a collection of ten Science Fiction stories describing the amazing adventures of the protagonist Professor Shonku. Apart from Satayjit Ray Bengali Science Fiction later evolves with the notable works of Lila Majumdar, Sunil Ganguly, K Roy, A Roychowdhury, Anish Deb, Shirshendu Mukherjee, Said Mustafa Siraj, Samarjit Kar, Swapan Banerjee and Samaresh Majumder.

The first Hindi science fiction was Ambika Dutt Vyas’s *Aaschary Vrittant* (The Strange Tale). It appeared in ‘*Peeyush Pravah*’, a magazine published from Madhya Pradesh. The influence of the adventure stories of Jules Verne’s *Journey to the Center of the Earth* could easily be seen on it. *Aaschary Vrittant* has a very interesting protagonist, Mr. Gopinath, who undertakes a breath-taking adventurous journey underneath the earth. The pioneered writing of Science Fiction in Hindi is seen through the works of Acharya Chaturse and Guru Dutt. A great amount of writing was done by this pair in the history of Hindi literature. Acharya Chaturse wrote around 400 novels out of which *Khagras* (The Eclipsed Moon), *Neelmani* (The Sapphire), and *Adhut Manav* (The Amazing Man) are considered Science Fiction. Similarly Guru Dutt wrote many novels but his only novel *Sangharsh* (The Struggle) falls in the category of Science Fiction. Recently, one autonomous organization called Indian Science Fiction Writers’ Association (ISFWA) is actively publishing Hindi Science Fiction stories in a quarterly magazine entitled ‘*Vigyan Katha*’.

It was very recently that some examples of Science Fiction in episodic forms were published in languages like Tamil, Malayalam, Kannada and Assamese. For example in Tamil language in the year 1959 Mahakavi C. Subramania Bhartiya whose story entitled, *Kakkai Parliament* (Parliament of the Crows) is said to have some science fiction elements. In Kannada, Dr. Sadanand Nayak with his famous love story employing a plot on heart transplant was considered to be an example of Science Fiction.
Indian Writing in English (IWE) or Indian English Literature (IEL), too, has episodic instances of Science Fiction writing. It is very clear that only after Independence and in the 20th century the impact of scientific and technological development could easily be seen on Indian writing in English, particularly on Science Fiction Writing. It was the film maker Satyajit Ray who restarted the children’s magazine *Sandesh*. He published some Science Fiction stories which revolve around the diaries of Professor Trilokeshwar Shonku in it. Ray’s Professor Shonku is an inventor who passes through many adventures. Later this work was acclaimed by Issac Asimov in his *The International Encyclopedia of Science Fiction*. Originally this work was written in Bengali. Later the collection of ten science fiction stories, *The Incredible Adventures of Professor Shonku*, was translated into English by Surabhi Banerjee. The stories were written in the 1960s.

Dr. Jayant Narlikar is one of the most inspiring figures in the history of Indian Science Fiction. It is sometimes claimed that Indian Science Fiction meets in Dr. Jayant Narlikar. He writes both in Marathi and English. *The Return of Vaman* and *The Adventurer* are the two books he published in English. He believed that Science Fiction is the best medium of popularizing science among the masses. Enakshi Chatterjee in this regard states:

> Judging from the swiftness with which this form of fiction has acquired respectability it would seem that it has provided a kind of new medium to express ideas with which an older generation of readers was not familiar. Even in our country where the impact of the scientific revolution has not been all pervasive we notice the growth of a new generation of readers who have a natural inclination for this particular type of fiction. The new crop of technology-oriented young readers present lucrative market for science fiction writers, provided the ever-increasing demand can be met. 24

Today some prominent young Indian Science Fiction writers like Samit Basu, Rimi Chatterjee, Anil Menon, Dr. D. P. Singh, Vandana Singh are creating very good works of Science Fiction. Samit Basu’s *Turbulence* (2010), Rimi Chatterjee’s *Signal Red* (2007), Anil Menon’s *The Beast with Nine Billion Feet* (2009), Dr. D. P. Singh’s *Stop Earth* (1995), and Vandana Singh’s *The Woman Who Thought She Was A Planet*
(2009) are highly impressive and praiseworthy works of Science Fiction. The young Indian Science Fiction writers are really showing great promise and are an integral part of the world of Science Fiction as well as the Indian fiction.

1.4. Parameters of Science Fiction

The present research will study the coherence between the basic parameters of Science Fiction and utilization and presence of some of the dominant parameters of Science Fiction in the selected works of Indian Writings in English. Under this heading the researcher intends to examine the basic parameters of Science Fiction in detail. The parameters can be grouped as follows:

1.4.1. Science in Science Fiction.

As discussed earlier (1.1.3.) in defining Science Fiction, in relation to science and technology, science is a predominant aspect in works. It is generally said that science fiction of today is the science of tomorrow. Science Fiction writers are always busy in anticipating changes in culture, society, politics, technology and tradition of the universe. Changes may be microscopic or gigantic for the humans that exist in the world. Futuristic science is involved in Science Fiction to handle the problems of society. During the 19th century, the scientists of the time floated the idea of mechanistic universe. The law, that the planets revolve around the sun in fixed orbits which could be measured without the change in deviation came in this period of time. But according to Philip Cane it was Kepler who first discovered this law. He observes:

Kepler not only discovered that the planets move about the Sun in oval paths, but he also noticed that each planet changes speed as it moves about its orbit. As the oval path brings the planet closer to the sun, the planet picks up speed. Kepler worked out the time it takes a planet to travel around the sun. The planets which are close to the sun take less time than those that are at greater distance away. 25

The Sun, therefore moves through the universe in a certain direction at many such suns and comets and galaxies. All suns and comets and galaxies move on their ways, which could be measured. Therefore it is possible to understand the universe’s clockwork mechanism. It was during this time in Physics, Mathematics that it was
proved how one force acted upon another. In Biology and Geology evolution was traced in connection with the present and the future. In Chemistry, reactions were put down on paper. It was the time in which mechanistic thinking dominated science. Out of this thinking came almost all works of Science Fiction of that time. By the discoveries of Einstein and by the formula $E=MC^2$ mechanistic thinking rose as never before. This formula and revolutionary changes in the subjects like Physics, Chemistry, Biology, Geology, and Technology made stronger reflective impact on the development of pre 1940 Science Fiction and vice-versa. Ray Cummings used and experimented with these ideas which Wells and Verne had reflected. Cummings toyed with the concept of robots, the machine men of the future which often figured in his tales. Ray Cummings played around with the past, the present and the future. Wells invented the time machine, but Cummings put it to full use.

Later, as the world became vaster, the viewpoint became more microscopic. Writers of Science Fiction anticipated microscopic changes in society. What we find in such works is depiction of voyages to planets, to the bottom of the sea kingdoms and republics, some weird animals, scientists, some fantastic cities and most importantly the size-changing chemicals in exploring the vast of the universe, the macrocosm. Robert Scholes opines:

...one of the great strengths of science fiction is its ability to perform “imaginary experiments”, to see how people will react to change before that change even occurs. In this case, we see again that science fiction while it may seem to be about science, actually only uses science- accurately or not- in order to achieve its primary aim of exploring the life and mind of man.26

Some writers of Science Fiction, for example, Asimov, used past history to create future history in their works. It is common that humanity follows patterns. Modern and postmodern writers used environmental science to predict the dangers of issues relating to Environment. Arthur C Clarke visualises positioning of an artificial satellite in an orbit. Today, many countries have their own communication satellites which orbit the earth. Many technologically advanced countries are having their own satellite world controlling communication. Thus the researcher presents how science in Science Fiction becomes the science of tomorrow. It is observed that writers of
Science Fiction present the probable changes of science and their possible impact on social, political, economical, and cultural tradition of the entire race.

1.4.2. The Handling of Space and Time in Science Fiction.

It is believed that in the stories of Science Fiction there is no limitation as such for using time and space if the story deals with space voyage or time travel. As Donald A. Wollheim says,

Modern Science Fiction is delineated by the far boundaries of time and space and the galactic civilization is the turning point of this universe building. Galactic civilization implies going to the Mars, and other planets. It also implies colonizing where colonizing is worlds and intellectual kinship. It implies mankind covering the space between the stars. It also implies a civilization taking from each other what is desirable, or what is best for each. It implies an end to boundaries and the acceptance of infinite future and infinite progress outward in the universe.27

Writers are particularly conscious of time and space. Some set the stories in time future with the voyage of Time Machine and some set their stories in time past by depicting advanced civilization in the past. Jules Verne in his 20000 Leagues Under the Sea and Journey to the Centre of the Earth goes under the sea and Earth respectively with suspense in utilizing time and space. He handles time and space as the most important aspects of his novels to create suspense. Unpredictable happenings could be seen in Wells’s time traveler in The Time Machine. To depict other civilizations the setting naturally becomes another or imagined planet. Writers are bound to set their stories in time past or future having space travel, either aliens visiting the Earth or the Earthmen’s visit to other planets. Sometimes writers are interested in travelling in the history of their mother planet and finding the information about the past civilization, its culture and tradition. In this regard, Honegger, Gottfried and Peter Kamp observe:

Bound to be gravitational prison from which he can escape only through the application of tremendous power, living at the bottom of an ocean of air, man has nevertheless sought to discover the secrets of space and time.28
Imaginary voyages consist of visit to the moon, planets, and stars. It is also visit to infinitely large or small future, visit to the centre of the earth, visit to galaxy or visit to the whole of the sea. Future prediction means what would happen to mankind, race, universe, galaxy, tomorrow or in the next century or a million years from now. It is a probable calculation about both good and bad potentialities. Thus time and space have no boundaries in their depiction in Science Fiction.

In Science Fiction space and time warps are ordinary techniques. They are used for rapid journeys around the galaxy, or for travel through time. But today's science fiction is often tomorrow's fact of science. The belief that space and time can be curved is fairly recent. A German mathematician, George Friedrich Riemann, described it in 1854. It remained just a piece of mathematics for sixty years. There is every possibility that the physical space we live in should be curved.

It was in 1905 that Einstein introduced the revolutionary ‘General Theory of Relativity’. It was a major intellectual revolution that has changed the way we think about the universe. It is a theory not only of curved space, but of curved or warped time as well. According to him space and time are intimately connected with each other. One can describe the location of an event by four numbers. The amount of warping in our neighborhood is very small.

It is because all the gravitational fields in the solar system are weak that space and time can be warped enough to meet the demands from science fiction for things like hyper space drives, wormholes, or time travel. At first sight, all these seem possible. For example, in 1948, Kurt Goedel found a solution to the field equations of General Relativity, which represents a universe in which all the matter was rotating. In this universe, it would be possible to go off in a space ship, and come back before you set out. Closely related to time travel is the ability to travel rapidly from one position in space to another. This could connect the two sides of the galaxy, and act as a short cut, to get from one to the other and back while your friends were still alive.

The other possibility is the alternative historic approach. It has been championed by the physicist David Deutsch, and it seems to have been what Stephen Spielberg had in mind when he filmed, Back to the Future. In this view, in one alternative history, there would not have been any return from the future, before the rocket set off, and so no possibility of it being blown up. But when the traveler returns from the future, he enters another alternative history. In this, the human race makes a
tremendous effort to build a space ship, but just before it is due to be launched, a similar space ship appears from the other side of the galaxy, and destroys it.

David Deutsch supports the alternative historical approach introduced by the physicist, Richard Feinman. The idea is that according to Quantum Theory, the universe doesn't have just a unique single history. Instead, the universe has every single possible history, each with its own probability. In some histories space-time will be so warped, that objects like rockets will be able to travel into their pasts. But each history is complete and self contained, describing not only the curved space-time, but also the objects in it.

According to string theory which is our best hope of unifying General Relativity and Quantum Theory into a Theory of Everything, space-time ought to have ten dimensions, not just the four that we experience. The idea is that six of these ten dimensions are curled up into a space so small, that we don't notice them. On the other hand, the remaining four directions are fairly flat, and are what we call space-time. If this picture is correct, it might be possible to arrange that the four flat directions get mixed up with the six highly curved or warped directions. It opens exciting possibilities.

The terms time warp, space warp, and time-space warp are commonly used in Science Fiction They sometimes refer to Einstein's theory that time and space form a continuum that bends, folds, or warps. Arthur C Clarke used this notion for writing his novels and predicted the artificial satellite orbit in 1953 which is now a reality. The researcher draws the conclusion that Science Fiction writers enjoy ample freedom of handling time and space element in their stories.

1.4.3. The Handling of Characters with Superpower, Machineries, Robots, Space-Voyages, Space-Ships, Combined with Realism

Jules Verne and H.G.Wells handled the characters by tracking the submarine, airships, the voyage around the moon, and by using telecommunication power, locomotion, and so on. The important thing about the projection is that both do not change their characterization and the scenes. Their inventions do not change their art of characterization. Verne and Wells’ works like many Science Fictions are imaginary voyages and remarkable inventions. They are connected to the future predictions by considering some social changes in mind. Wells is more a satirist in his works. For
example *The Time Machine* and *The War of the Worlds* introduce two humanities which are neither desirable nor destined for immortality. Both are satirized in their presentation of characters.

Some writers of Science Fiction make their heroes so powerful, so omniscient, and so gifted as to have doubts whether the heroes are really gods in disguise. Some characters are so gifted that they are able to change shape at will, able to be a spaceship and a submarine, able to think with computer-like capacity and speed and be able to move as fast as light and so on. It is because Science Fiction writers do not set any boundaries of time and space to man’s power. According to them humanity has no limitations. It is called megalomania.

The mystery novel deals with saving a single or individual or poetic justice of someone; war novel deals with the fate of cities or nations, but Science Fiction deals with the fate of the entire world or planet or galactic empire, or the whole race or even the Universe. Thus Science Fiction writers create characters that not only make the Universe but also save the entire Universe. Men and women who appear in Science Fiction stories are merely representatives of humanity.

It is acknowledgeable that man is only a small part of the Universe- an infinitely greater order which itself gives Science Fiction its characteristic flavor. Darko Suvin in this regard makes a very valid observation. He thinks:

If SF narration hinges on the presence of a novum which is to be cognitively validated within the narration, then this novelty has to be explained in terms of the ‘specific’ time, place, agents, and cosmic-cum-social totality of each narration-i.e. in terms of its ‘possible world’. This means that, in principle, SF has to be judged-like ‘realistic’ fiction.29

The researcher assumes that writers of Science Fiction present characters that are intellectually, psychologically, socially and economically far more advanced, superior to and more developed in many respects than the present humans. By doing this, they take for granted that human development is immediately or remotely possible.
1.4.4. Narrative Technique benefits in Minimizing the Distance between Setting and Events.

It is very important for the Science Fiction writer to have a story teller who can tell the story very effectively, credibly, probably even when he is talking about incredible or improbable things. It is really a masterly and a difficult task before the writer to create a narrator who can minimize the distance between setting and events, imaginary and real, improbable and probable, unbelievable and believable and impossible and possible.

In the history of Science Fiction, it is witnessed that the narrator of Science Fiction succeeds in doing this. He creates a sense of realism which is applicable to the present or the future or what has already happened to Mankind. Science Fiction has introduced new ultramodern ways of narration. An omniscient narrator creates the effect on the mind of the reader that whatever he is narrating is plausible. Science fiction is a literature of ideas, and as such very often it has strange ideas to communicate to readers. Science Fiction incorporates new technologies and developments of such technologies as its subject matter.

Very few writers make use of or experiment with new ways of telling a story. Though there are examples in Science Fiction in the likes of hypertext, but in quantity it has been minimal. The credit for experiment with narration goes really to the new wave movement within science fiction, and to some extent within cyberpunk. They made the real attempt to escape the limitations of traditional narrative storytelling. Science Fiction is also called extrapolative. As Ursula K. LeGuin observes in her book *The Language of the Night*:

> The science fiction writer is supposed to take a trend or phenomenon of the here and now, purify and intensify it for dramatic effect, and extend it into the future. 30

In this regard Isaac Asimov also wrote about the predictive nature of science fiction, and it is worth quoting him at length:

> To people who don't read science fiction, the most amazing thing about the field is its apparent ability to predict the future . . . . Actually, there is very little in the vast output of science fiction, year after year, which
comes true, or which is ever likely to come true . . . . Nevertheless, successful prediction can take place. Intelligent science fiction writers attempt to look at world trends in science and technology for plot inspiration and in doing so, they sometimes get a glimpse of things that later turn out to be near the truth. 31

Patricia S. Warrick, in her book *The Cybernetic Imagination in Science Fiction*, comments:

> Although the traditional elements of narrative such as plot, characters, setting and symbolism are present in science fiction, they are subordinated to other elements, the central concerns of SF. Those other elements are such things as the use of current scientific knowledge, a sense of the new, a different place or time than our own, and the ability of the ideas in the work to engage a reader's intellect and offer new insights. Science fiction, therefore, is more interested in communicating. 32

The rationale for avoiding the experiment in narration is not hard to find. Science Fiction is concerned with communicating ideas. And since the ideas in science fiction are concerned with strange things, places, races, civilizations and the new, the familiar format of narration is most suitable for presentation. In this regard C. S. Lewis puts it best:

> Every good writer knows that the more unusual the scenes and events of his story are, the slighter, the more ordinary, the more typical his persons should be. Hence Gulliver is a commonplace little man and Alice a commonplace little girl. 33

Thus, when the science fiction writer’s main concern is to express a particular idea, an unfamiliar storytelling style would get in the way. Simple and straightforward narrative makes the strange ideas accessible and science includes in its subject matter aliens, other planets, societies of the near and distant future, and even stranger ideas. To avoid confusion, it is necessary to present Science Fiction stories in a commonplace manner.
Another view is that some Science Fiction writers of the 1960s tried to challenge the traditional form of narration. The British New Wave writers began to work with more experimental story structures. New Wave writing adopted many narrative techniques from mainstream literature, including experimental forms. The mid-1980s writers of cyberpunk were particularly interested in new technologies, but at the same time they were wary of utilizing them for new ways of telling stories. Even the novel that epitomizes the Cyberpunk movement, such as William Gibson's *Neuromancer*, is a work strongly rooted in the realist tradition. There are some notable attempts outside the new wave and cyberpunk to use experimental forms to tell a science fiction story. For example, Robert Silverberg's story *Sundance* shifts point of view between first, third, and even second person within a single short story. Pamela Zoline's story, *The Heat Death of the Universe*, is another experimental Science Fiction, which consists of 54 paragraphs, most numbered, some titled and some a mere sentence in length. Thus the researcher believes that it is very important for a Science Fiction writer to minimize the distance between setting and events. And to do so he has to use the traditional form of narration which is most suitable for Science Fiction.

1.4.5. The Presence of Epical Pattern, Element of Suspense, Grandeur and Impossible Probabilities and Improbable Possibilities

There is a resemblance of elements between traditional form of epic and modern form of Science Fiction. The first is handling of theme or subject. Epic deals with a lofty or a broad subject. As it is very common to go with a grand subject, Science Fiction is concerned with issues relating to an entire race or planet or universe. Science is universal, so naturally the subject of Science Fiction becomes universal. Science Fiction states that there is a multitude of parallel worlds, all earths with some alteration. It is therefore necessary to go for their history and the present and the future. These worlds of Science Fiction are the most favorite in modern science fiction writing. There is a scope for sociological speculation and heroic adventure. A Science Fiction writer offers satisfaction in the form of presenting his subjects. For example since his subject is unknown, he has ample opportunity to create suspense, excitement and a sense of adventure. The sciences of Chemistry, Biochemistry, Biology, Physics, Engineering, and Astronomy have captured the trendy
imagination. This is the reason why Science Fiction has reached a much larger audience than the other forms of literature.

The second epical element is that of adventure. In the epic, adventure is bound with hero’s fight against the evil and a journey from unexpected places and miracles to stability at the end. In Science Fiction an adventure consists in imaginary voyages and imaginary voyages consist of visits to the moon, planets, and stars. It is also visit to an infinitely large or small future, visit to the centre of the earth, visit to galaxy or visit to the whole of the sea. People have made up their minds regarding the intelligence around and over other stars and planets and also the possibility of coming back- and forth in time. Today’s Science Fiction is the science of tomorrow. Many plausible premises that are discussed are possible reality in future. It is written elsewhere that the first man who landed on the Moon was interested in reading Science Fiction of Wells. Undoubtedly, so many premises appear probable possibilities: spacecraft or space travelling, existence of aliens, landing on stars, robotic machines, time travelling (travelling thousands of light years inch by inch), and automatic bombs. It is also about discoveries, novum, a new thing on which the story rests.

The third epical element is handling of characters. Characters in the epic are both human and godly figures. The main character or protagonist is heroically larger than life, often the legend or a national hero. The deeds of the hero are presented without favoritism, revealing his failings as well as his virtues. The action, often in battle, reveals the more-than-human strength of the heroes as they engage in acts of heroism and courage. Gods or divinities play active roles in the outcome of the action. Such characters possess desirable potentialities of human beings. In Science Fiction as well, characters are human figures and some are mechanical robotic intelligence or aliens possessing advanced power. Modern Science Fiction stories freely deal with sociological possibilities and the movements of humanity under future condition. Therefore writers give infinite power, potentialities to some characters, which humans desire to possess.

Suspense is observed both in the epic and Science Fiction through the adventure and action of heroic figures. It combines with future predictions of a writer. Prediction means what would happen to mankind, race, universe, galaxy tomorrow or
in the next century or a million years from now. It is also a possible calculation about both good and bad potentialities of mankind.

Epic involves the element of mythological references. It is also said that epics are about gods, divinities, virtues and vices in order to establish morality. In the epic narratives gods or divinities play an active role. The element of mythology is not at all a dominant aspect in science fiction. It may or may not be present. Science Fiction names some characters from mythology and even some concepts are based on mythical tales. Thus, there is a close connection between mythology and Science Fiction.

Both in the epic and Science Fiction the setting covers several nations or the whole world or the universe, metaphorically or symbolically. The setting is universal but highly connotative in terms of man’s desire to have communication with the other world, other planet or other civilization.

Both in the epic and Science Fiction the episodes are interwoven into the plot.

Epic observes the law of poetic justice at the end. Good is rewarded and vice is punished. Social satire is the writer’s intention; to hold a mirror to the present by means of the future or of an imaginary land. Writers sometimes are not serious, sometimes they give a somber warning or a dire prediction in talking about what we are, where we will be and where we are all going to be and what does it all mean to Mankind. Thus the researcher presents how some epical elements or patterns are always present in Science Fiction.

1.4.6. Writers’ Attitudes to Science and the Genre of Science Fiction

It is generally observed that Science Fiction writers possess sufficient background of science. On the other hand, many Science Fiction writers are primarily scientists. To popularize science they go with the form of Science Fiction. But in their approach both to the form and science variation can be noticeable. For example Campbell used a mechanical approach to psychology, sociology and history. He believed in humanism. He understood that the human mind ought to be handled in the laboratory by using appropriate techniques and objective methodology. From this ‘kinetics’ came forth. H.G.Wells’s attitude to science and Science Fiction was that
sociology and human relations should merge with modern sciences for the necessary part of Science Fiction. Some anticipated the changes in human relationships due to technology, some presented interdependency of science and human life. It is also observed that some place overemphasis on science or scientific part in the text and devalue literary elements. However some effectively keep a balance between fiction and science. Some observe a majority of literary principles and some declare in their note how they are not conscious enough to handle the form well. By and large, writers of Science Fiction are concerned with society and therefore they predict some sudden or slow political, psychological, cultural, economical changes of human tradition not of a particular society but of the whole of human race.

The form of Science Fiction has the opportunity to reach a much larger audience than other forms of the novel. This is, mainly, because there are many scientists who write Science Fiction in the hope of giving knowledge of likely developments in science. Therefore the researcher assumes that SF writers write very seriously about immediately likely developments in the field of science.

1.4.7. Juxtaposition of Science and its Use in the Present and the Future

Science Fiction shapes the future. Whatever speculations or visions are drawn by Science Fiction writers, they certainly affect the future. Science Fiction generates talks about the present and the future prediction with the sense of logical reasoning. They talk about probabilities. Many plausible premises are discussed as possible reality in future. It is written somewhere that the first man landed on the Moon was interested in reading Science Fiction of Wells who anticipated the same. Undoubtedly probabilities are built up with the mention of space craft or space travelling, existence of aliens, landing on stars, robotic machines, time travelling (travelling thousands of light years in inch by inch), automatic bombs. Peter Coles, in this regard, observes:

Applications of new scientific ideas for example in technology and medicine have altered everyday life to an equally remarkable extent, at least in the developed world. In many cases these developments have been for common goods, although they have sometimes resulted in great social change and have left large sections of society behind.35
Modern Science Fiction stories deal freely with sociological possibilities and the movements of humanity in the future time and condition. Arthur C Clarke’s 1953 prediction of artificial satellites in the orbit became a reality later. Many nations put their satellites into the orbit for the purpose of information and communication technology. It is observed that in Science Fiction juxtaposition of science with the present and the future is present.

1.4.8. Interface between Science and Fiction

There is an interface between science and fiction. To put it in other words, there is a resemblance between the two entities- science and fiction in terms of their elements, functions, characteristics, purpose and mechanism. Any work of Science Fiction is considered partly a book of science and partly a literary novel. This is so, because it has the scientific world view as well as the characters and events are fictitious or imaginary. Adams Roberts claims:

Infact, it can be asserted that science fiction itself as a broad statement of aesthetic strategy, has always sought to resist the notion of ‘the two cultures’. Science fiction is the place where art and science connect. It is empirical proof that arts and science do not constitute a binary economy.36

The genre combines various elements of both science and fiction. The differentiation between the regular novel and the science fiction is clearly stated in terms of their background. The usual novel deals with the social background or even with any other background, while the science fiction deals with a particularly scientific background of modern science. The first point is vision. Vision is to take efforts in transforming the present condition of man into a utopian state by removing drawbacks and weaknesses. Both scientists and fiction writers visualize good things for human life. Both take efforts and propose to make human life happy and the earth a better place to live by presenting the possible dimensions in their respective works.

The second aspect is characters who are involved in making a better place for living. In fiction, characters have intentions, either good or bad. In science too characters are scientists who conduct a lot of experiments in keeping with their intention to do good for a particular society. Scientists are always busy in action. They
live their lives for their race. A lot of their research is for the sake of humanity. Basically they are moralistic in their role and have the function to serve humanity. Fiction writers present characters allegorically. Fictional characters resemble human beings in their minute and larger forms. They represent the common feelings like greed, truth, revenge, anger, love, gratitude, affection and so on. Some are selfish and some are selfless. Such feelings are also present amongst scientists. But the process of character-building takes place in both fiction and science.

There is an existence of an organized body of knowledge or truth both in science and fiction. Both in the novel and science, demonstration of knowledge of contemporary times is made. Both science and fiction aim that man should be energetic, humble, constructive and critical in action. Results are reliable. Logic and imagination go together in shaping human life in relation to science. Both in science and fiction the element of truth is dominant. Truth lies in presenting various feelings in the case of fiction and introducing various facilities for men in the case of science. The effective use of science and technology reduces man’s futility and makes his life comfortable. Science is very much concerned with it. The sole aim of fiction is to teach truth. It teaches man to be truthful always. By introducing poetic justice, fiction writers show that they value virtues and punish vices. Both science and fiction are busy in their search of truth and delivering the different aspects of truth.

Romance or adventure is another aspect to look for in the novel. Both in science and fiction the element of romance or adventure is present. Space voyages with the help of time machine is adventurous. Similarly scientists are busy in conducting various experiments with the origin of the Earth or the universe which is highly adventurous. It is assumed that science studies facts, logic, and results in relation to real human life to make life comfortable. In fiction imagined voyages are depicted and similarly adventures of the protagonist are narrated in relation to real human life, to make life more daring. Thus both science and fiction by nature are involved in various forms of adventures.

Both in fiction and science suspense is a vital element which generates curiosity amongst the people concerned. Science deals with a lot of experiments and results. But the gap between experiments and results is full of suspense. Similarly, in fiction suspense is generated through characters’ action and intention which lead to results.
Science Fiction anticipates or predicts some probable changes in cultural, social, political tradition of the entire human race. Like science, fiction presents an idealized world of humans. Scientists and fiction writers are bound to create an idealized world. Both science and fiction speculate over desirable results for the betterment of human life. Both predict positive and negative things resulting from the maximum use of technology through the story.

Science and fiction present how logic and imagination go together in shaping human life in the world of science and technology. The researcher avows that Science Fiction interfaces the elements of science and fiction in depicting human life in its ideal state.

1.4.9. Balance of Romance and Realism

Romance is a type of narration in which adventures of idealized characters in some remote or enchanted setting are presented. It is in opposition to realism. The term does find its connection now with other literary forms, namely, gothic, scientific romances, detective stories. Scientific romances of H. G. Wells are yolked to the genre of romance to give us science fiction. But romance originally belongs to the tales of King Arthur’s Knights written in the Middle Ages by Sir Thomas Malory.

On the other hand, realism is a mode of writing that gives an impression of recording realistically the actual way of life. The term can be referred to in two ways—one accuracy of description and second is rejection of idealism, escapism and romance. As a literary trend it associates with 19th century novel depicting the problems of ordinary people.

Science Fiction combines both the element of romance and realism by presenting the need of scientific and technological adventures which are useful for the betterment of society. It is assumed that science studies facts, results in relation to real human life. Fiction deals with day to day adventures of life. Science Fiction combines these two and effects a balance between the two. H.G. Wells wrote all his works of Science Fiction in this manner. He presented war, combat, battle of humans with aliens or machines. He handled the Victorian problem of opposition between science and religion. The realistic issue of colonialism is also highlighted in The War of the Worlds. In modern Science Fiction many writers have used the form to criticize the
contemporary issues of society. The researcher affirms that the balance of romance and realism could naturally be seen in Science Fiction.

1.4.10. Prophetic Vision and Changes in Social, Political, Cultural and Tradition of the Universe.

Many works of Science Fiction deal with future prediction. They fall in the category of future predictions— the stories that talk about what could happen to mankind or to the earth or to the next century or a million years from now. It is also about calculating good and bad possibilities or potentialities. Science Fiction renders the plausible into scientific possibilities of being realized at some future time. We have the initial voyages to the moon and to the planets of our solar system. In this system the stories of Martians, Jovians, Venusians talk about the parents’ world, their interplanetary commerce, spaceship trade lanes, space pirates. Another voyage is the first flights to the stars, that is, the starships that can travel to centuries.

Prophetic vision deals with the change in the present political, social, economical, geographical, scientific, technological, religious, cultural tradition of the universe or entire race. Prophecy or prediction is a very important aspect of a work of art. In fiction writers tend to visualize some changes relating to society or culture. In post colonial literature it is this dominant element where the writer is set to change educational, political, cultural tradition of the community which had experienced imperialism and its adverse effects. In the case of Science Fiction, the writer is concerned with the entire community or human race, not a small group or community. Writers are inspired by the view that scientific phenomena or ideas that lead to change in social, political, cultural tradition of the entire race or universe exist presently. On this assumption they start writing novels. They predict slow or sudden, positive or negative changes to the entire world. Many a time their prophecies or predictions come true as they are largely based on the contemporary developments in science and technology. The very realistic example is of Arthur C Clarke’s prediction about making of an artificial satellite in orbit for communication, in 1953. Currently many such satellites are working in the orbit representing their nations. The sudden cultural change takes place after the innovation of satellite communication. Media and communication become more effective due to this innovation.
The researcher believes that the prophetic vision present in Science Fiction depicts the probable changes in cultural, political, economical and social tradition of the universe.

1.4.11. Themes or Novum or Issues Handled in Science Fiction

The most exciting part of Science Fiction is its subject or theme. Though it is claimed that Science Fiction suffers from repetition of subjects, there are ample opportunities for each writer to handle the genre differently. Some of the common themes of Science Fiction are, rivalry of insect civilization with humanity, war tanks, man eating planets, collision with another star, super accelerating of life, man-superman with superpower, germ development, travel begin the dimension, aerial warfare, future city, atomic power, decline and fall of galactic empire. Another is space travel. It is used very frequently. If asked to define Science Fiction, many have the stock answer to say, ‘Oh! Stories about Space Ships’. Modern Astronomy has revealed the structure of our solar system and galaxy. One of the most amazing aspects of this new knowledge is incomprehensible distances between stars. It would take a Space Ship travelling at 25000 mph about 6 months to reach Mars. One of the nearest stars to our Sun is Procyon: it takes about 22 years to reach there and back at the speed of light-i.e.1,86,000 miles per second.(1 mile = 1609344 km). To enjoy Science Fiction we must accept the belief that there exist other planets capable of supporting human life. A group of astronomers believe that there is a possibility of having around 1000000 planets alone in our Galaxy which support life like the Earth. The universe did start- how, why, and when are the solid speculative themes for the Science Fiction writers. Astronomically, we can say or answer that the origin of the universe has been established on a Big Bang theory. Several years ago one giant atom burst and as a result the Earth, merely, one piece of that burst, came out to exist. Very few writers have discussed issues and results relating to themes like population, overpopulation and the atom bomb. The third topic that seems more popular among scholars, politicians came up only after America’s attack on Japan in 1945. Harry Harrisons’ book Make Room! Make Room! (1966) does talk about overpopulated Earth in the year 1999. Though we are in 2010’s such an observation cannot be denied. Harrison warns humans to get ready to tackle the problem of population. Asimov predicts “there is a race in man’s future between a death-rate rise and birth rate decline, and by 2000, if the latter doesn’t win the former will”. 37
The alien invasion is another common theme in Science Fiction. There are a number of texts and films in which such a theme is handled with a great care. Some writers visualize an option for the existing planet Earth and depict the new system of colonialism. The invasion scenario has been used as an allegory. The famous example is H.G. Wells's novel *The War of the Worlds*. Another example is William Tenn’s *The Liberation of Earth*.

Earthly defense against invasion is a recurring theme in science fiction usually designed to prevent an invasion by an external force. Some planetary defenses in science fiction are less fantastical than often proposed. For instance, the BBC television series *Doctor Who*. Another means of planetary self-defense in the face of an alien invasion is the use of a team of individuals to whom is assigned the duty of repelling or destroying the invading force. Often this team is composed of a mixture of superheroes, superhumans, or individuals with profound abilities in areas that may be applicable to fighting an alien army. An example of such a team combating an alien invasion fleet is in the film *The Avengers* (as well as in the same-titled comic book on which the film is based). In the film, *The Avengers*, a team of superheroes comprising Iron Man, Captain America, Thor, The Hulk, Black Widow and Hawkeye assemble together to defeat an alien army bent on conquering the Earth. Ultimately, the Avengers are successful in repelling and halting the invasion, and the Earth is saved from alien dominance. The researcher observes that there is a recurring pattern of theme in Science Fiction only variant lies in the presentation.

1.5. Conclusion

Thus, in this chapter, the researcher has presented a theoretical framework. It has highlighted the emergence and the development of the form of Science Fiction both in European context and Indian context. The study tries to focus on how the basic parameters of Science Fiction can be grouped by analyzing some of the definitions, elements and characteristics. This chapter deals with the progress and development of the form in detail and in relation to parameters of Science Fiction. Since the soul of Science Fiction is to open various aspects of its author’s creativity, knowledge of science and to give an aesthetic insight to the readers, the researcher has tried to give a detailed account of various parameters of Science Fiction so that the readers and pupils find them easy to understand it. Thus, an attempt has been made to
analyze, and to interpret the parameters of Science Fiction in detail for the parametric study of Jayant Narlikar’s *The Return of Vaman* (1990), Rimi B. Chatterjee’s *Signal Red* (2007), Anil Menon’s *The Beast with Nine Billion Feet* (2009) and Samit Basu’s *Turbulence* (2010).
1.6. References


Chapter II:

A Parametric Study of Jayant Narlikar’s *The Return of Vaman*-Plea for an ethical restraint on scientific excesses